BUNN®

Operator's Manual

CONTENTS

LIST OF ILLUSTRATIONS

FOREWORD

This manual contains instructions for the installation, operation, preventative maintenance, troubleshooting, and repair parts identification for your Tying Machine Model manufactured by the B. H. Bunn Company, Alsip, Illinois. Proper use of the manual should ensure safe and efficient operation and maintenance of the tying machine.

Because of the increasing staff of Service Representatives, B. H. Bunn Company can now offer a Maintenance Contract. Contact your local Service Representative, who is capable to render factory approved service, for full detail maintenance contract information, or the B. H. Bunn Company.

Section 1 INTRODUCTION

PURPOSE OF TYING MACHINE

The primary purpose of the tying machine is to automatically tie mail, packages, cartons, pieceparts, printed matter, newspapers, laundry, produce, meat, corrugated cardboard, and miscellaneous materials and products requiring a secure wrap (figure 1). The tying machine ties almost everything that was previously wired, banded, taped, strapped or previously tied by hand in offices, factories, and commercial establishments. The tying machine reduces tying time, employee effort and fatigue, reduces twine lint and twine waste, enables trained operators to make secure ties quickly, ties larger bundles with greater ease and efficiency, and discourages tampering because the tied knot cannot be duplicated by hand tying.

GENERAL DESCRIPTION

The tying machine (illustrated on the Characteristic Sheet at the front of the manual) consists of a main table assembly, knotter head assembly, stringholder assembly, drive assembly, twine arm, and base parts. The tying machine is of steel and cast iron construction. Caster wheels are provided for fast easy mobility. All moving parts are enclosed except for the twine arm which is shielded by a twine arm guard to prevent accidental contact from the sides or rear of the tying machine. Controls are located in the front of the tying machine within easy and comfortable reach of the operator. An operator's foot pedal provides the means to activate the tying machine. Operator maintenance points are easily reached without the use of tools. Refer to the Model Characteristics Sheet at the front of the manual for additional information for your tying machine model.

PRINCIPLES OF OPERATION

SINGLE WRAP

With the tying machine power cord connected to an appropriate power source, the power switch set to the "on" position, the bundle to be tied properly positioned on the front table and back table, the single wrap tying cycle is started by the operator applying toe pressure to the foot pedal.

Power from the electric motor assembly is transferred to the drive assembly through the drive-belt. Through a series of gears, the drive assembly rotates the twine arm around the bundle. As the twine

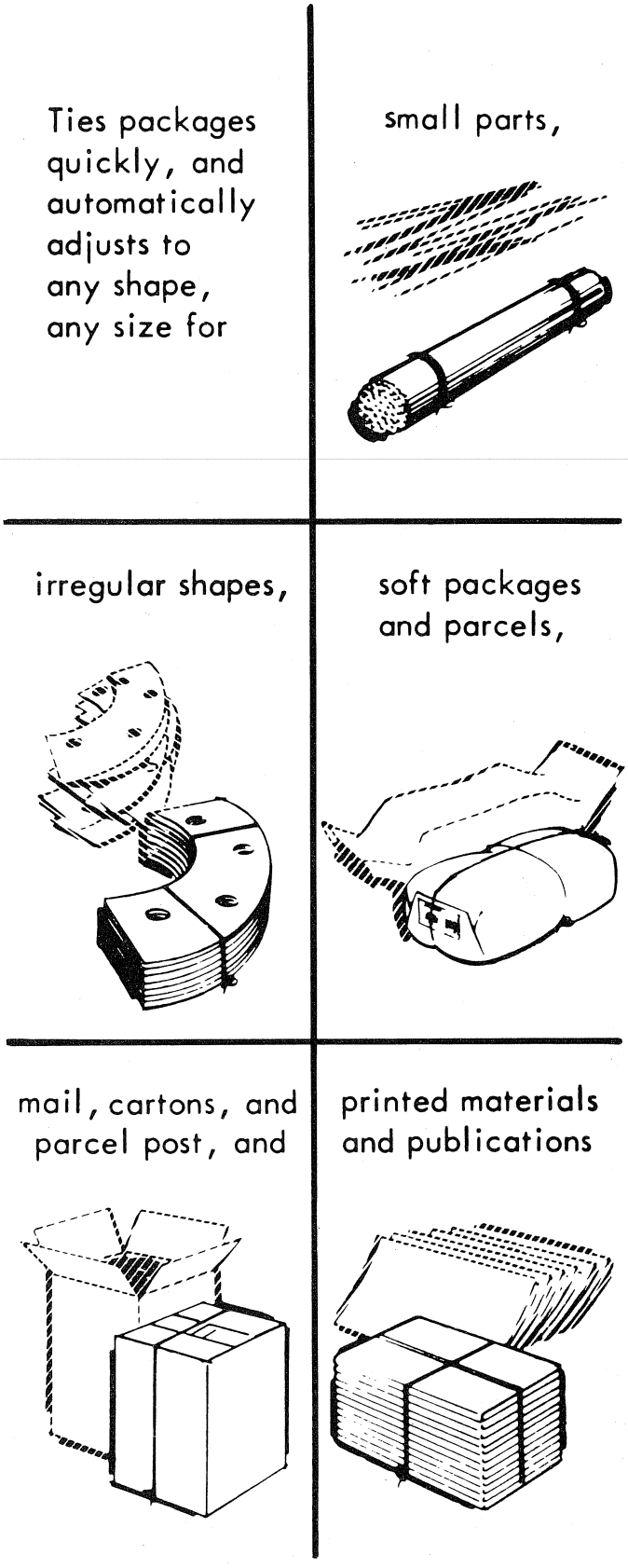


Figure 1 Tying Capabilities

travels through the twine arm and passes the drawslide, the drawslide snaps back allowing the twine to fall into position behind the stringholder button. The drawslide then pushes the twine across the main table to the other side of the knotter body assembly.

The knotter body assembly moves forward catching the twine and turns counter-clockwise opening its jaws for the two strands of twine which are wrapped around the knotter body assembly. The strands of twine are brought through the jaws and the jaws firmly lock. The knotter body assembly then moves toward its finished position and the stripper forces the twine strands off the knotter body assembly jaws into the tight parts of the knot. As the two strands of twine are pulled into loops from the knotter body assembly jaws, the knife trap moves forward, cuts a fresh end of twine and pulls the previously cut end of the twine from behind the stringholder button. The knotter body assembly completes its movement to the finished position and the knotter body assembly jaws to release the loops, completing the tying process.

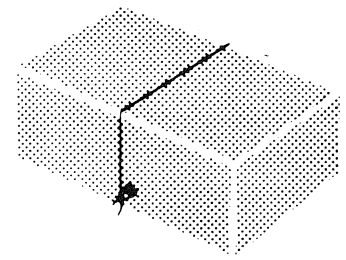
The tied bundle is then removed from the tying machine.

DOUBLE WRAP ONE-WAY

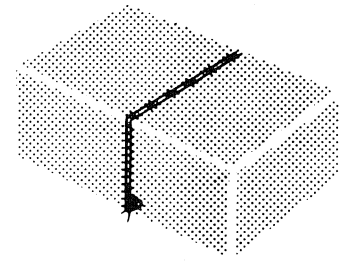
The double wrap one-way tying machine operates in exactly the same manner as the single wrap one-way tying machine previously described except that the automatic knot-tying and twine-cutting processes are not performed until the twine arm rotates twice (or three times, as applicable) around the bundle being tied.

DOUBLE WRAP CROSS TIE

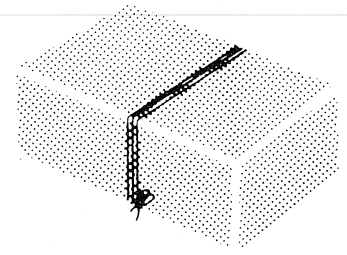
The double wrap cross-tie tying machine operates in exactly the same manner as the single wrap machine previously described above except that the twine arm rotates once around the bundle being tied then automatically stops. The operator properly repositions the bundle 90 degrees in a clockwise direction, again applies toe pressure to the foot pedal, and the twine arm rotates around the bundle once more automatically completing the knot tying process. The bundle is cross-tied once in each direction with one strand of twine and is tied with one knot.



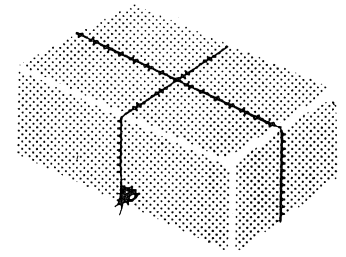
Single Wrap
The arm carries the twine around once and the knot is formed.



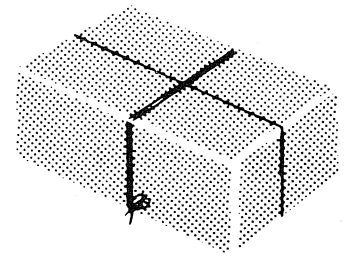
Double Wrap
ONE WAY
Two wraps in one direction with one knot.



Triple Wrap
ONE WAY
Three wraps in one direction with one knot.



Double Wrap*
CROSS TIE
One wrap in each direction with only one knot.



Triple Wrap**
CROSS TIE
One wrap in one direction; two wraps in other direction — with only one knot.

*Double wrap cross tie also provides: (1) two wraps in one direction if package is not turned between wrap cycles; (2) one way by tripping out the first wrap.

**Triple wrap cross tie additionally provides: (1) three wraps in one direction if package is not turned between wrap cycles: (2) two wraps one way by tripping out the first wrap.

Figure 2. Basic Types of Different Wraps

Section 2 PREPARATION FOR USE

UNPACKING INSTRUCTIONS

The tying machine is shipped in a wood reinforced corrugated cardboard carton or in a wood slat enclosed skid crate. Follow the unpacking instructions that apply to your tying machine. The plastic bag protecting the machine during shipment can be used as an effective cover for the tying machine when not in use.

CARDBOARD CARTON UNPACKING

1. Remove staples at bottom of cardboard carton securing cardboard carton to skid.

2. Carefully raise and remove carton from tying machine.

3. Carefully open and remove plastic bag protecting tying machine.

4. Cut bands securing base frame of tying machine to skid and then pull tying machine away from skid.

SKID CRATE UNPACKING

1. Carefully pry or knock top and side wood slats off of skid using a pry-bar or hammer.

2. Carefully open plastic bag that is protecting tying machine and remove plastic bag.

3. Cut bands securing base frame of tying machine to bottom of skid.

4. Pull tying machine away from skid. Note metal bar wedged through front and rear caster wheels on the left hand side of tying machine. Carefully knock metal bar out from caster wheels using a hammer.

5. Refer to the Twine Arm Guard Instruction Sheet packed with the Twine Arm Guard and associated hardware to assemble and mount the guard to the tying machine.

If any problems are encountered, contact your local B.H. Bunn factory representative.

POWER REQUIREMENTS

The single-phase, 1/4 hp, 1725 rpm standard motor provided with your tying machine requires an external power source of 115 volts at 60 Hertz. A standard three-prong electrical cord is provided with the electrical motor. If a three-prong receptacle is not available at the installation site, a three-prong adapter should be used with the electrical cord. Upon request, optional electrical motors are available to meet specific power requirements. A convenience outlet for the electrical power cord should be installed at the working location(s) to reduce the hazard of tripping over the cord. When installed the convenience outlet must meet all the electrical standards and wiring color codes for your geographical area.

TYING MATERIALS

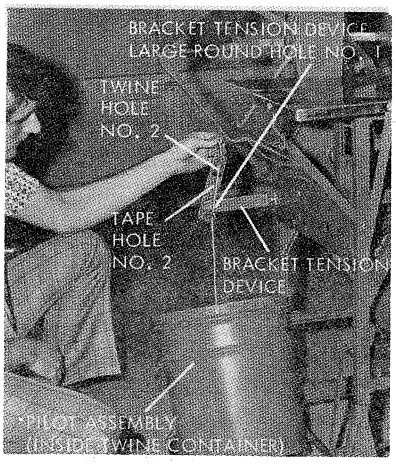
The tying machine is adaptable to a wide range of tying materials ranging from natural fibre twines to synthetics which can replace wire and strapping in a great many applications. Be sure that the twine or tape being used is of the proper type for the tying application. The right Bunn tying twine can improve production up to 50 percent because it has been tested and approved for use on your machine. It runs through the machine smoothly. Bunn Twine is of uniform size and strength and is free of knots and irregularities that snag and break. It is superstrong and fray-resistant, with minimum linting eliminating twine snagging and breaking. A free sample folder showing actual twine samples and specifications is available through your local B.H. Bunn factory representative or the B.H. Bunn Company.

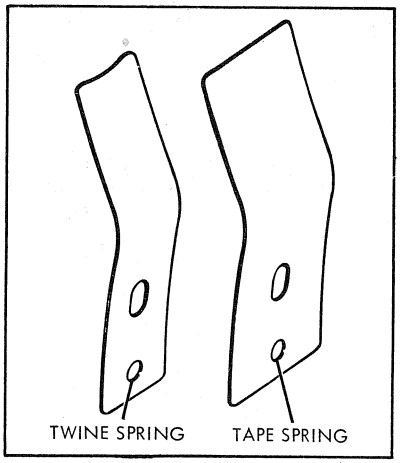
TWINE CONTAINER

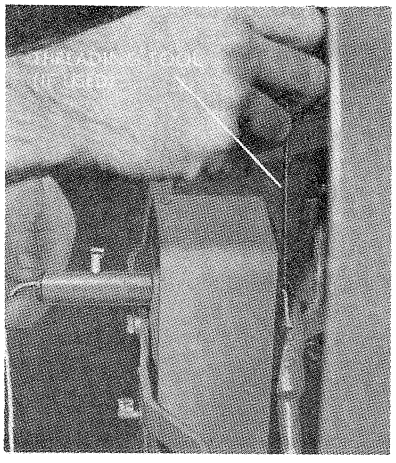
The twine container will hold up to a 10-pound cone of twine. The base diameter of the cone must not exceed 9 inches. Conversion kits are available through you B.H. Bunn Company factory representative when and if it ever becomes necessary to change to a different material-twine to tape or tape to twine.

ILLUSTRATED THREADING PROCEDURE

Before the tying machine is shipped, it is threaded through each guide starting from the twine container to the stringholder button. To avoid threading problems in the future, you should become familiar with the threading sequence at this time. Complete threading of the tying machine can be avoided if the end of the twine or tape being used is caught before it leaves the twine container. This is accomplished by simply tying the end of the existing twine or tape to the strarting end of the new twine or tape with a square knot. If the end of the twine or tape is not caught before it leaves the twine container, the tying machine must be threaded as explained in the subsequent procedures. It is important to observe the various openings which are identified by numbered labels affixed to the machine through which the twine or tape is to be threaded. Never thread machine while motor is operating.







1. Place power switch in "OFF" position.

2. REMOVE ELECTRICAL CORD FROM POWER RECEPTACLE.

3. Lift twine container cover and position cone of twine or tape over the cone pilot assembly inside twine container. Press firmly until seated on foam pad at bottom of twine container.

NOTE

When using twine or tape cones that are less than 5 pounds, it will be necessary to install a second foam pad in the bottom of the twine container.

4. Grasp starting end of twine or tape and thread through twine container cover opening and then secure twine container cover.

5. Pull approximately 5 to 6 feet of twine or tape and thread through large round hole at bottom of bracket tension device labeled No. 1.

6. Gently pull tension spring back and thread:

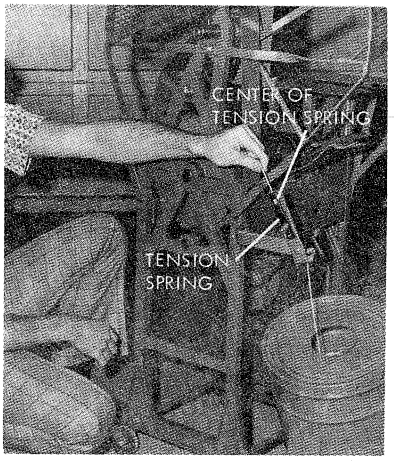
Twine Through bracket tension device small round hole.

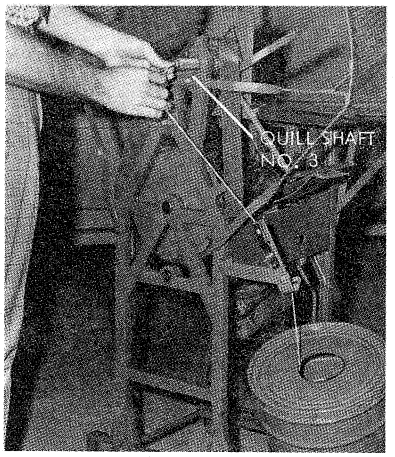
Tape Through bracket tension device large round hole.

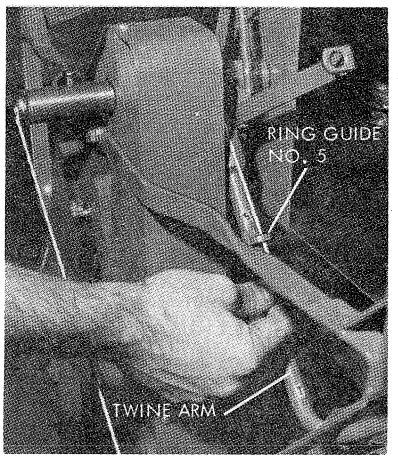
NOTE

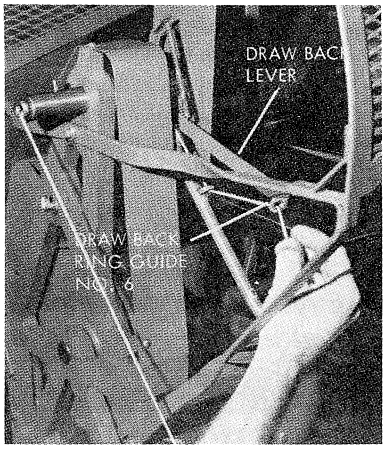
Both holes are identified by Number 2 Label.

7. Release tension spring making sure twine or tape is positioned under center of tension spring.



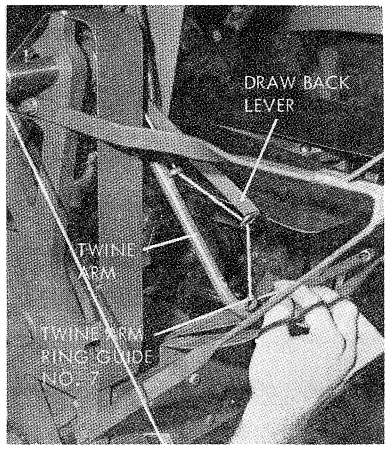




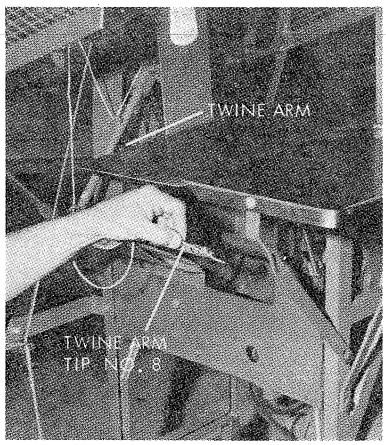


NOTE

Make sure that appropriate tension spring is installed before proceeding with the threading of the tying machine. It is recommended that a threading tool which may be purchased from your local Bunn factory representative be used to perform steps 8 and 9.

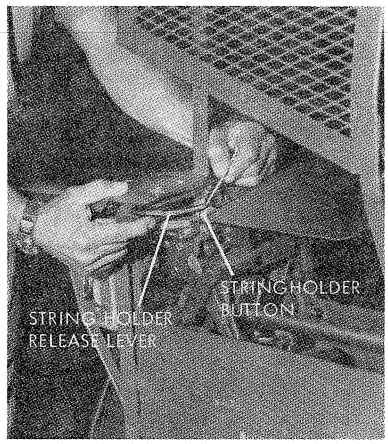


8. Insert twine through quill shaft labled No. 3.

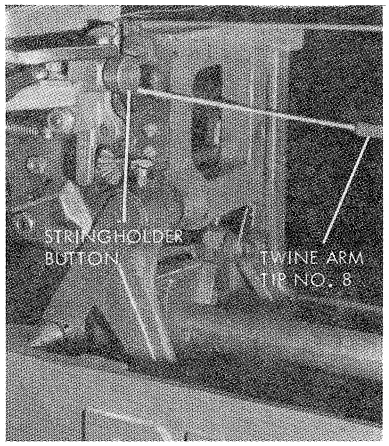


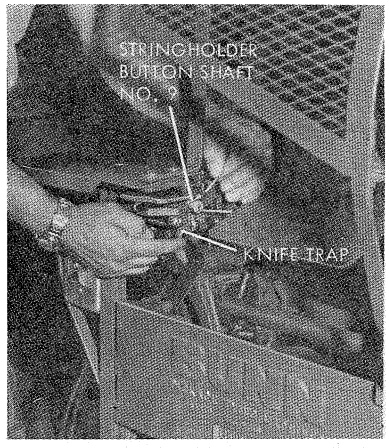
9. Fish twine or tape out from quill shaft labled No.4. After twine or tape is free, thread twine or tape through ring guide labeled No. 5 on twine arm.

10. Pull twine through backside of draw back lever opening labeled No. 6 and then down through ring guide labeled No. 7 at bend in twine arm.



11. Continue to thread twine or tape through twine arm tip labeled No. 8. Pull twine over to the right die of tying machine and press back stringholder release lever. Place twine under stringholder button shaft labeled No. 9, pull up and over shaft and release stringholder release lever. Pull twine taut and press knife trap toward front of tying machine to cut off excess twine.





Section 3 OPERATION

BEFORE OPERATION CHECKS

1. TURN MASTER SWITCH TO THE "OFF" POSITION.

2. Check tying machine threading sequence.

3. Check twine or tape cone for proper positioning over cone pilot assembly in twine container.

4. Check if twine or tape cone is properly seated on foam pad of twine container.

5. Check twine running tension by pulling twine from end of twine arm assembly. A smooth easy running tension should be felt.

6. Test V-belt tension by depressing at approximately the center of V-belt. Maximum deflection should be 1/8 inch.

7. Visually check tying machine for any mechanical defects or missing parts.

8. Verify that electrical power cord is inserted into receptacle and then set power swithc to the "ON" position.

TYING SIZE LIMITATIONS

The capacity graph on the Model Characteristics Sheet at the front of the manual indicates the maximum height and width of the packages that can be tied.

The only other dimension which controls the tying capacity is the "throat" depth of the tying table. This is the distance between where the tying twine (or tape) goes around the package to the backstop, or the maximum distance you can slide the package into the tying machine. The "throat" depth is also tabulated on the Model Characteristics Sheet.

Some tying machines adjust automatically to handle packages of varying sizes and shapes that are smaller than its maximum capacity. The first package may be a small bundle of piece-parts. The second may be a package of odd-shaped pieces. The third may be a soft package. The fourth could be a large box or carton.

ONE-WAY WRAP OPERATION

1. Stand in front of the tying machine at the operating position — the widest side of the fixed table.

2. Set power switch to "ON" position.

3. Hold ends of package between thumbs and forefingers of both hands and position package on tying machine table so that right side of package is butted against standard (figure 3) and positioned over gap between front and back tables.

4. Momentarily depress foot pedal holding package firmly until tying cycle is completed. The tying cycle is completed after the twine arm makes the required wraps, one, two or three.

NOTE

The tying machine automatically compensates for the size and shape and the different lengths of twine required. The tying machine also automatically applies the correct amount of tension, ties the patented slipproof and temperproof knot and then cuts the twine.

5. Remove package from tying machine.

6. Repeat steps 3 through 5 above for each package to be tied.

7. After all packages have been tied, set power switch to "OFF" position.

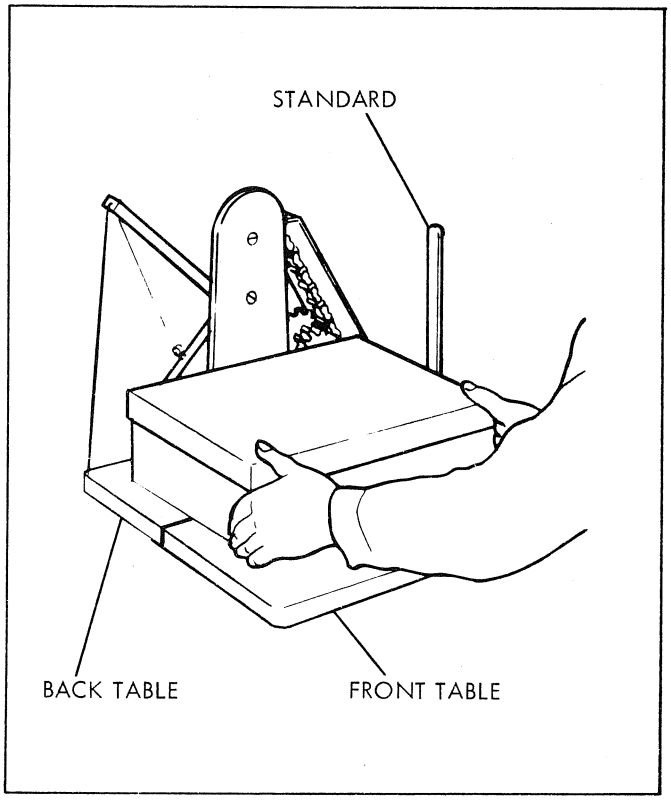


Figure 3 Positioning Package for Tying

CROSS WRAP OPERATION

1. Stand in front of the tying machine at the operating position — the widest side of the fixed table.

2. Set power switch to "ON" position.

3. Hold ends of package between thumbs and forefingers of both hands and position package on tying machine table so that right side of package is butted against standard or notch in front table (figure 4) and positioned over gap between front and back tables.

4. Momentarily depress foot pedal holding package firmly until tying arm completes one revolution.

5. Turn package 90 degrees IN CLOCKWISE DIRECTION (figure 4) in tying machine.

6. Depress foot pedal (second time) holding package firmly until tying cycle is completed.

7. Remove package from tying machine.

8. Repeat steps 3 through 6 above for each package to be tied.

9. After all packages have been tied, set power switch to "OFF" position.

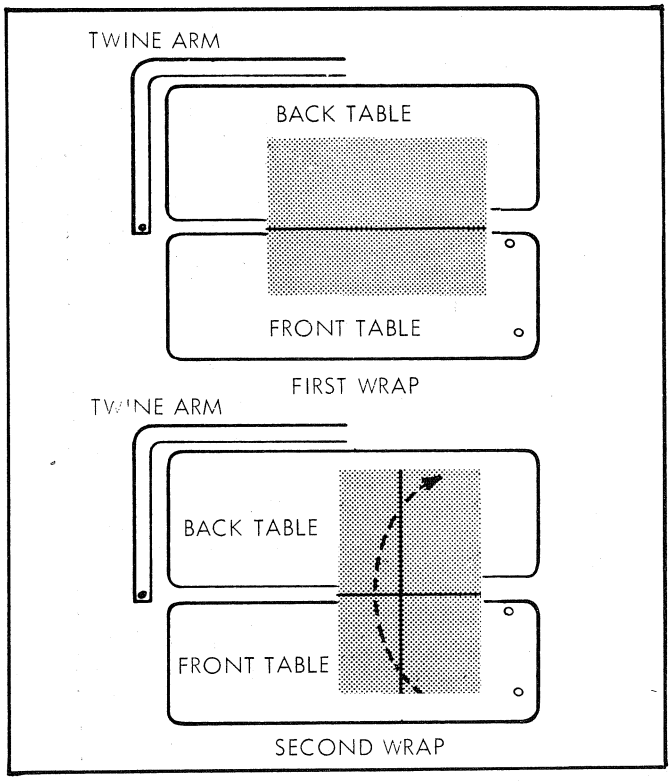


Figure 4 Positioning Package for Cross-Tie

AFTER OPERATION PROCEDURES

1. Check supply of twine or tape remaining in twine container. If supply is low tie the end of the existing twine or tape to the starting end of the new twine or tape with a square knot.

2. Clean any lint that may have collected in stringholder casting hole. A small pair of tweezers can be used for this purpose.

3. Cover tying machine with plastic bag used to ship tying machine.

Section 4 MAINTENANCE

INTRODUCTION

The following paragraphs provide maintenance instructions and maintenance function schedules. Maintenance responsibility of the tying machine should be assigned to the maintenance mechanic or other authorized personnel.

A good preventive maintenance program is a major step forward to assure trouble-free tying machine operation. In order to be effective, routine inspection, lubrication, and adjustment schedules must be established and followed. The following Table of Preventive Maintenance Checks and Services and Table of Lubrication Requirements is provided for tying machines subjected to normal usage which is considered to be approximately 30 hours of operation weekly. Substantial deviations from normal usage should require an adjustment in the indicated frequencies. Frequencies established in the Table of Preventive Maintenance Checks and Services are: Daily (D), Monthly (M), and every third month (Q). The Table of Lubrication Requirements has frequencies of 50 and 150 hours. The tables should be copied for use by maintenance personnel, to facilitate checking off each item as it is performed. These lists can then be signed and dated to serve as an accurate record of preventive maintenance work performed. Deviations from normal tying machine usage should become a part of the records for the tying machine.

TABLE OF PREVENTIVE MAINTENANCE CHECKS AND SERVICES

CHECK OR SERVICE ITEM	FREQUENCY		
	D	M	Q
ELECTRICAL COMPONENTS			
1. Check electric power cord and plug. Cord should not be frayed and should be securely fastened. Plug should not be faulty.		X	
2. Check electric motor assembly, especially breather vents, which should be free of dirt and foreign particles.		X	
3. Operate electric motor assembly and listen for abnormal noises.	X		
4. Check condition of power switch to verify that it is securely mounted and operating properly.	X		
MECHANICAL COMPONENTS			
1. Operate tying machine and observe that it ties a bundle or package correctly.	X		
2. Remove lint and loose twine from stringholder button holes using a small pair of tweezers.	X		
3. Check twine (or tape) running tension. Readjust twine tension spring if necessary.		X	
4. Check condition of knife. Knife should be sharp and free of knicks. Replace if necessary.	X		
5. Check for proper position of star wheel and shaft assembly gear and observe gear for excessive wear. Replace if necessary.		X	
6. Check for cracked or broken teeth on gears and sprockets and main gear. Replace as required.			X
7. Check condition of V-belt, V-belt tension, and evidence of slipping. Correct tension is 1/8 inch deflection. Readjust if necessary or replace as required.	X		
8. Check for loose pins and set screws in gears.			X
9. Check entire tying machine for loose hardware. Tighten loose hardware as required.	X		
10. Check for broken or weak knotter flat springs and weak tension. Replace as required.	X		

TABLE OF LUBRICATION REQUIREMENTS

LUBRICATION ITEM	FREQUENCY	
	50 HOURS	150 HOURS
NOTE Apply several drops of SAE oil or equivalent unless otherwise specified. If necessary, refer to the exploded views in the parts list section of this manual for assembly part nomenclature.		
KNOTTER HEAD ASSEMBLY		
1. Oil cup (Knotter Head Pivot).	X	
2. Two oil holes (encircles in red on machine).	X	
3. Between knotter lever and knotter head subassembly.		X
4. Around diameter of knotter roller.		X
5. Knotter lock plunger.		X
STRINGHOLDER ASSEMBLY		
1. Between knife trap rivit and knife trap lever assembly.	X	
2. Between knife trap shoulder screw and knife trap lever assembly.	X	

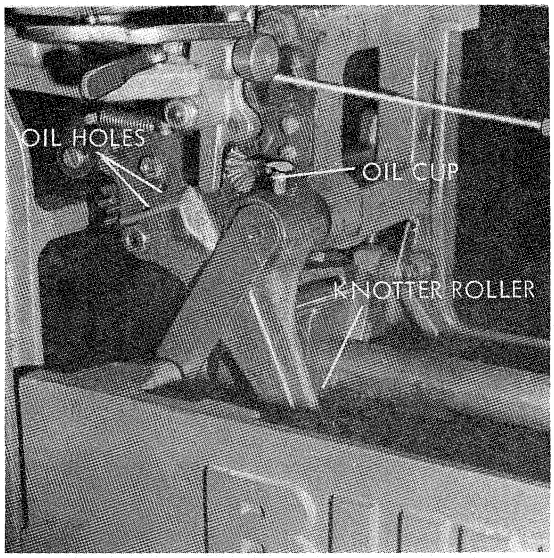


Figure 5
Knotter Head Assembly Lubrication Diagram

Figure 6
Stringholder Assembly Lubrication Diagram

LUBRICATION ITEM	FREQUENCY	
	50 HOURS	150 HOURS
MAIN TABLE ASSEMBLY		
1. Around diameter of drawslide lever assembly roller.	X	
2. Between washer and drawslide lever assembly.		X
3. Between drawslide lever assembly and main table subassembly.	X	
4. Into three oil holes (encircles in red on machine).	X	
5. Between stripper and main table subassembly so that stripper pivot pin is lubricated.	X	

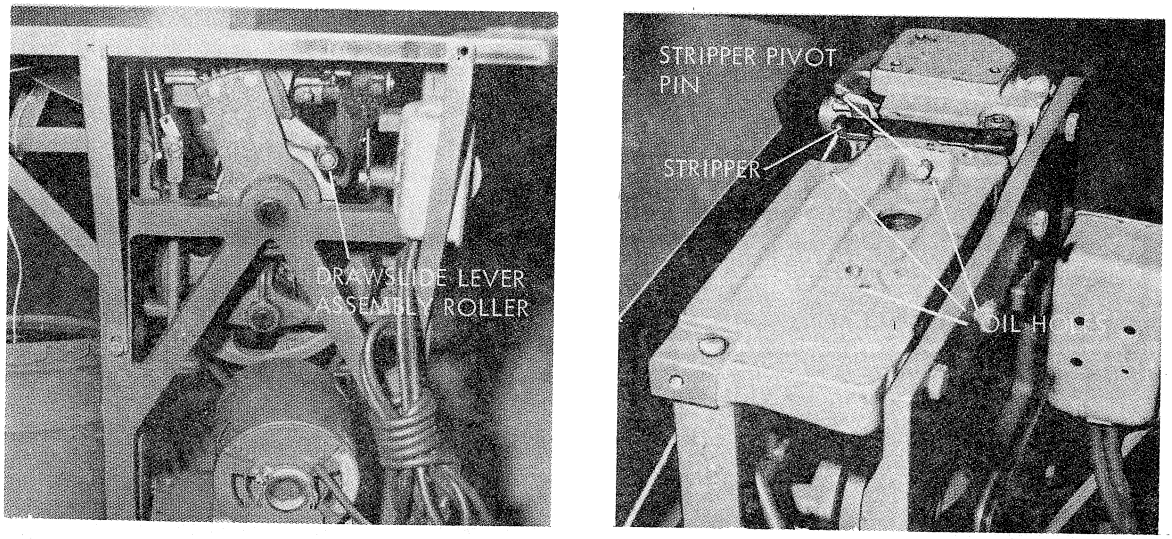


Figure 7 Main Table Lubrication Diagram

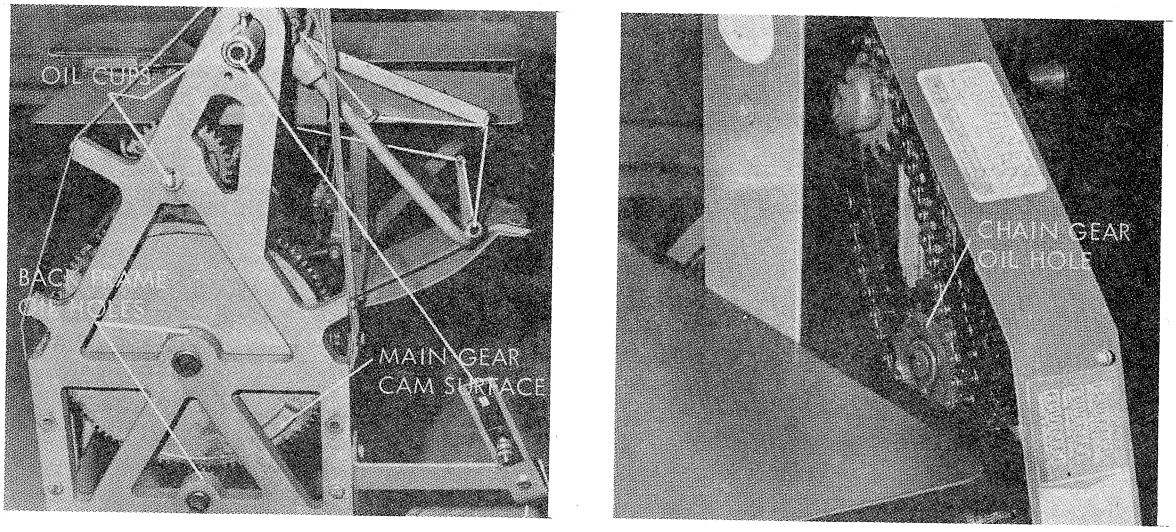


Figure 8 Drive Assembly Lubrication Diagram
(1 of 2)

LUBRICATION ITEM	FREQUENCY	
	50 HOURS	150 HOURS
NOTE Apply a liberal coat of recommended lubriplate to the following unless otherwise specified.		
DRIVE ASSEMBLY		
1. Main gear cam surface.		X
2. Knotter rack assembly cam surface and teeth.		X
3. Cam riser cam surface.		X
4. Cam switch cam surfaces.		X
5. Apply several drops of SAE 10 oil to chain gear oil hole (encircled in red on machine).	X	
6. Apply several drops of SAE 10 oil to the two oil cups.	X	
7. Apply several drops of SAE 10 oil to the back frame two oil holes (encircled in red on machine).	X	
8. Main shaft (encircled in red on machine).	X	
9. Clutch shaft (encircled in red on machine).	X	
10. Clutch fork pivot (encircled in red on machine).	X	

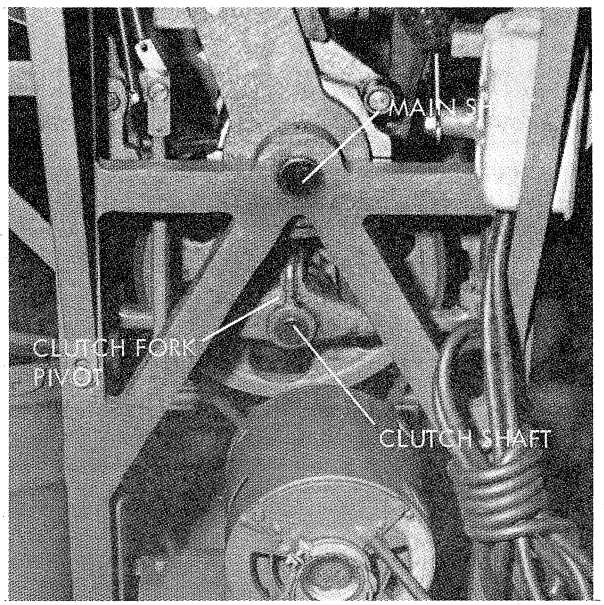
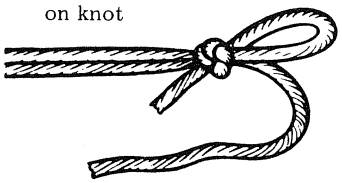
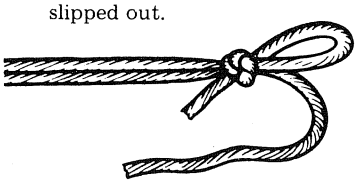


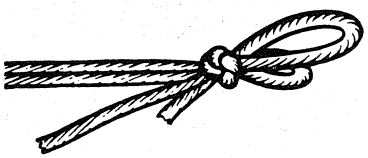
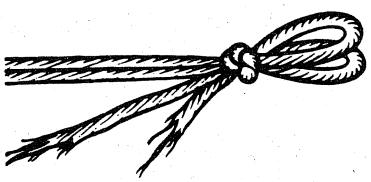
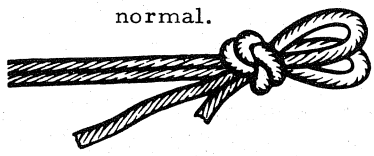
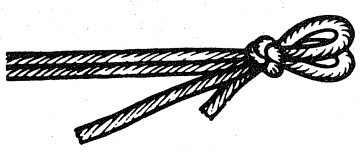
Figure 8 Drive Assembly Lubrication Diagram (2 of 2)

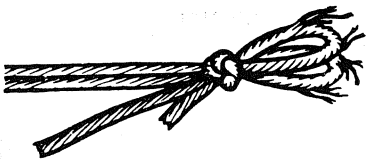
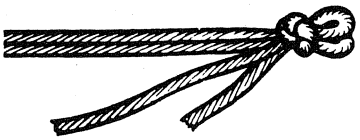
Section 5 TROUBLESHOOTING

This section of the manual contains a Table of Trouble Shooting Information for locating and correcting most of the troubles which may develop in the tying machine. The tying machine is generally trouble free. However, the tying machine suffers the usual wear and misadjustment from normal use. Careful inspection and accurate analysis of the symptoms listed in the Table of Trouble Shooting Information will localize the trouble more quickly than any other method. This manual cannot cover all possible troubles and deficiencies that may occur, therefore, if a specific trouble is not covered herein, proceed to isolate the major component in which the trouble occurs and then isolate and correct the trouble.

TABLE OF TROUBLESHOOTING INFORMATION

TROUBLE	POSSIBLE CAUSE	CORRECTIVE ACTION
a. Tying machine will not operate with power switch set to "on" position.	Electric power cord not plugged into receptacle.	Plug electric power cord into receptacle.
	Circuit breaker tripped.	Reset circuit breaker. If circuit breaker trips again, inspect and test for short in tying machine circuit or electric power cord. Correct defect as required.
	Broken or disconnected circuit wire.	Repair or replace broken wire.
	Faulty power switch.	Replace defective power switch.
b. Twine (or tape) breaks frequently in stringholder button.	Improper twine (or tape).	Use proper size of twine (or tape).
	Excessive stringholder button tension.	Readjust stringholder button pressure.
c. Half or single loop on knot 	Piece of twine (or tape) wrapped around stringholder button shaft relieving tension on twine (or tape).	Depress and hold button release lever and remove bits of twine (or tape) using a small pair of tweezers. Then release button release lever.
d. One loop knot that slipped out. 	Excessive twine running tension.	Readjust to decrease twine running tension.

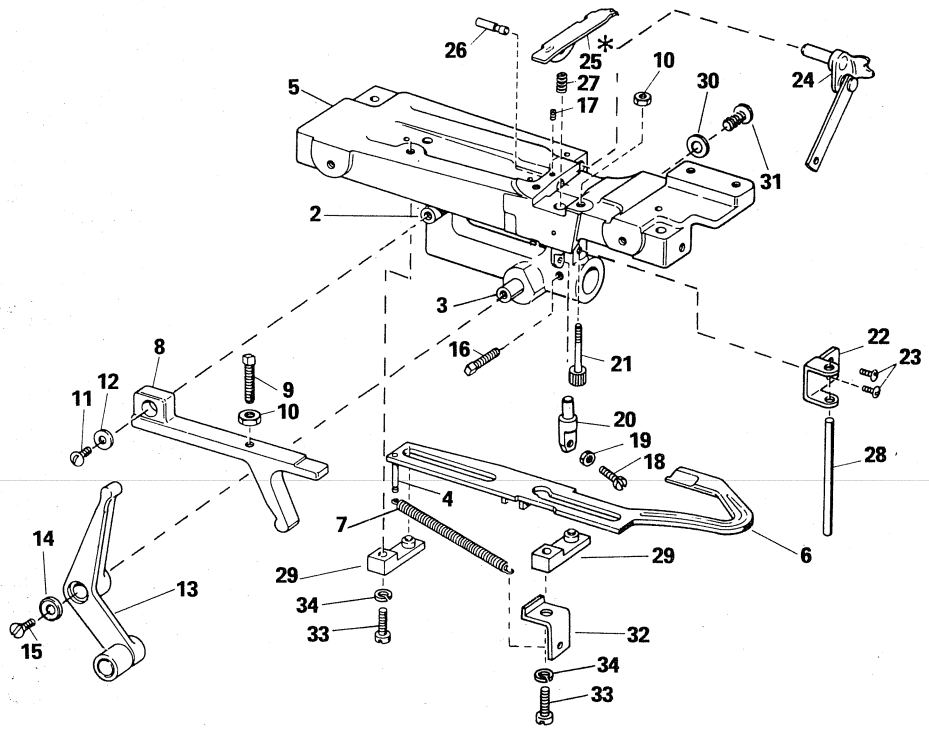
TROUBLE	POSSIBLE CAUSE	CORRECTIVE ACTION
e. One long and one short loop. 	Improper twine (or tape). One loop catching in back of knotter throat, improper knotter release adjustment.	Use proper size of twine (or tape). Readjust knotter release.
f. Break in twine in front of knot. 	Friction along twine (or tape) path.	Remove sharp edges from twine path in twine tension plate assembly, twine bracket, quill shaft, twine arm hub, twine arm assembly ring guides, drawback lever, and twine arm tip.
g. Ragged ends of twine at knot. 	Dull or knicked knife.	If knife is excessively knicked, replace. If knives continue being knicked, lubricate knife trap pivot points to assure that knife trap does not stick, allowing knife to remain in path of drawslide.
h. Loose knot and loops slightly shorter than normal. 	Loops release from knotter too soon, improper knotter release adjustment. Stripper too short.	Readjust knotter release. Replace stripper.
i. Short loops and tight knot. 	Improper balance between twine running tension and stringholder button pressure.	Check stringholder button pressure. Readjust twine running tension.

TROUBLE	POSSIBLE CAUSE	CORRECTIVE ACTION
j. Cut loop ends. 	Stripper points shearing against side of knotter jaws when stripping.	Readjust stripper shear action, bend top front end of stripper down tapping with a light hammer.
k. Very short loops and long ends. 	Knot slipping by stripper. Improper gap between stripper point and knotter.	Realign stripper point and knotter.
	Knotter flat springs broken or weak.	Replace knotter flat springs.
l. Twine (or tape) catches in stripper.	Stripper spring broken or weak.	Replace stripper spring.
m. Twine (or tape) pulls out of stringholder button.	Twine (or tape) improperly threaded.	Check stringholder button threading and rethread if necessary.

Section 6 PARTS LIST

They tying machine is identified by the model number and serial number stamped on the name plate located on the right side frame of machine. Be sure to use both the model number and serial number when requesting part information or when ordering replacement parts. Using the complete equipment identifier (model number and serial number) will ensure receipt of proper replacement part(s). If your tying machine is equipped with a frame extension, it is recommended that the size of the extension frame also be provided along with the complete model identifier when ordering replacement parts.

MAIN TABLE ASSEMBLY



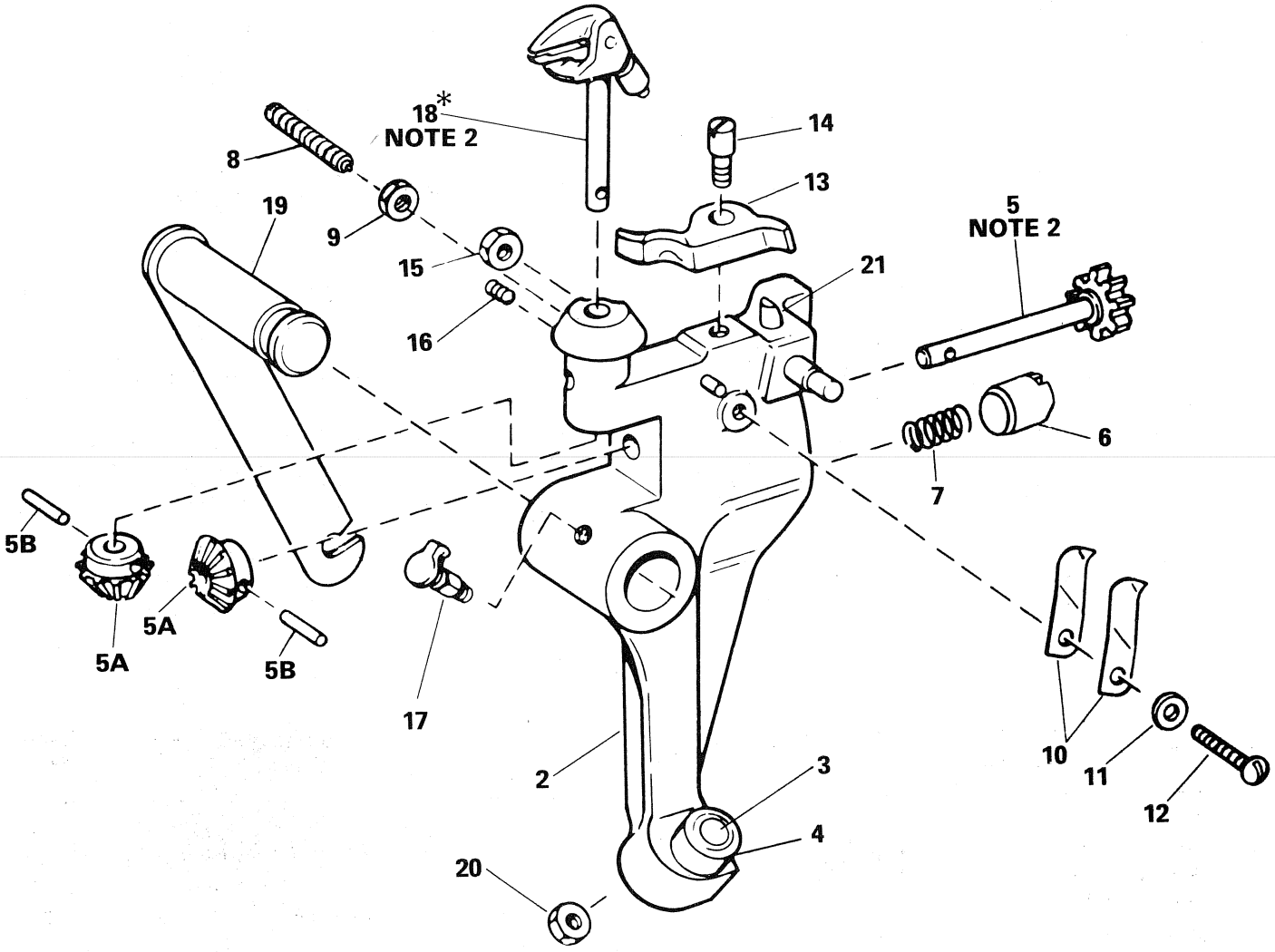
Index Number	Part Number	Description	Number Required
1	008—	Main Table Assembly	1
2	081014	Riser Lever Stud	1
3	081013	Drawslide Lever Stud	1
4	100158	Drawslide Spring Pin	1
5	008009	Main Table Sub-Assembly. Note	1
	008017	Main Table Sub-Assembly (Clamp Model) Note	1
6	045—	Drawslide and Cap Assembly	1
7	074014	Spring-Drawslide	1
8	032003	Riser Lever	1
9	100124	Screw-Set, square head, half dog point, 1/4-20 NC x 1 in. long	1
10	100150	Nut-Hex, 1/4-20 NC	2
11	100098	Screw-Round head, 10-24 NC x 3/8 in. long	1
12	100042	Washer-Flat, 1/2 o.d. x 7/32 i.d. x 3/64 in. thk.	1
13	032075	Drawslide Lever Assembly	1
14	100019	Washer-Drawslide Lever	1
15	100103	Screw-Flat head, slotted 1/4-20 NC x 1/2 in. long	1
16	100596	Screw-Set, square head, cup point, 1/4-20 NC x 3/4 in. long	1
17	100121	Screw-Set, socket head, cup point, 8-32 x 1/4 in. long	1
18	100018	Screw-Knotter release adjusting	1
19	100191	Nut-Jam, hex, 1/4-28 NF	1
20	081056	Stud-Knotter release	1
21	100591	Stud-Knotter head stop	1
22	083073	Guide-Riser pin	1
23	100099	Screw-Round head, self tap 10-24 NC x 3/8 in. long	2
24△	032035	Tip-Up Assembly	1
25△	052—	Stripper	1
26	083071	Pin-Stripper pivot	1
27△	074006	Spring-Stripper	1
28△	083060	Pin-Riser	1
29	070049	Drawslide Cap Assembly	2
30	100134	Washer-Drawslide Lever	1
31	100566	Screw Drawslide Lever	1
32	025288	Bracket Drawslide Spring	2
33	100104	Drawslide Screws 1/4-20 x 1 in. long Filister Head	2
34	100135	Washers Split-Lock 1/4 in.	2

— Tying Machine Model Number and Serial Number Required When Ordering.

* Specify Type Twine or Tape Being Used. △ Not Part of Assembly, Order Separately.

NOTE: Sub-Assembly includes Items 2, 3, 4, 10, 16, 17, 18, 19, 20, 21, 22, and 26.

KNOTTER HEAD ASSEMBLY

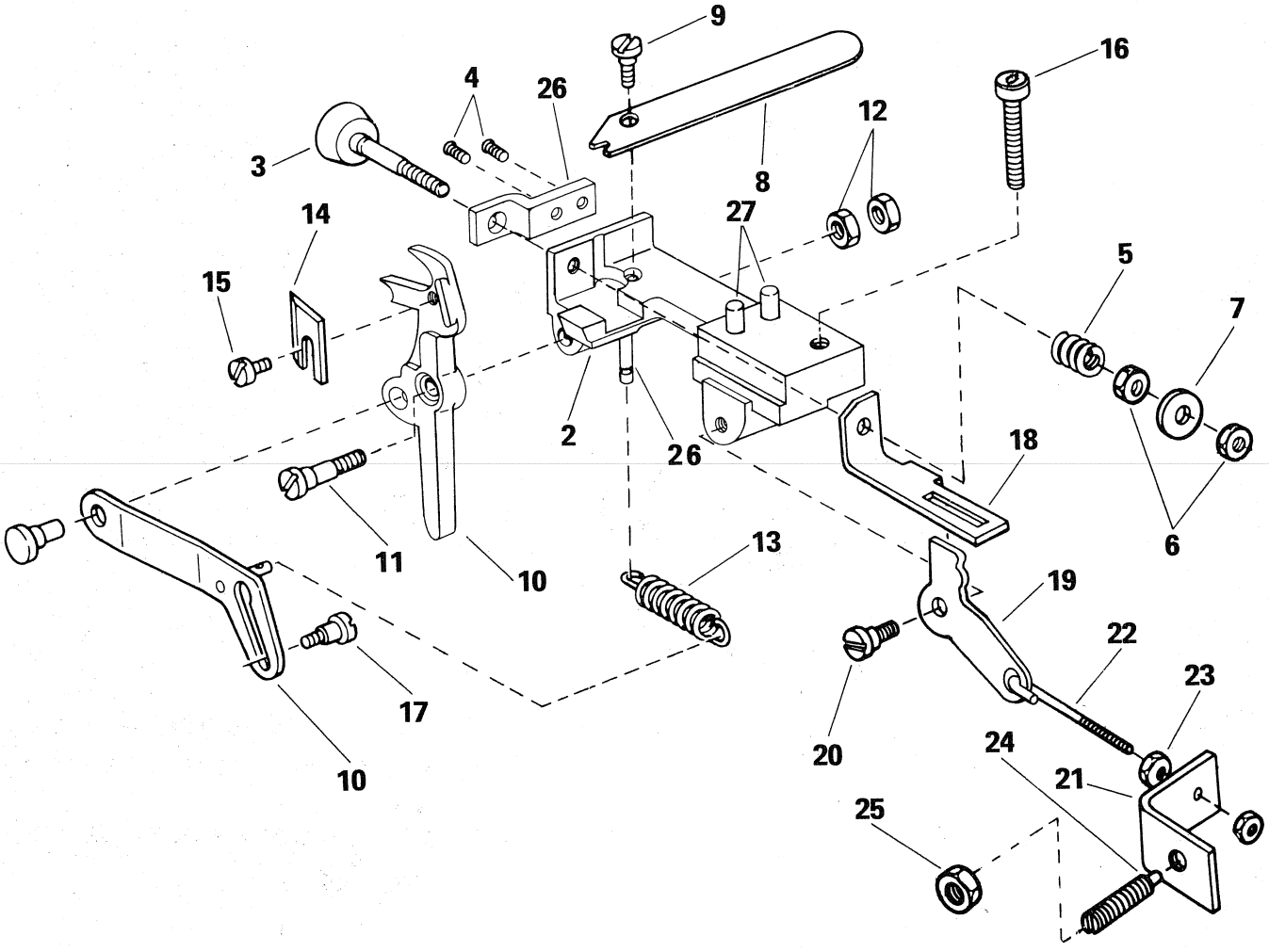


Index Number	Part Number	Description	Number Required
1	017—	Knotter Head Assembly	1
2	017035	Knotter Head Sub-Assembly	1
3	081020	Knotter Head Roller Stud	1
4	064008	Knotter Head Roller	1
5	020157	Star Wheel & Miter Gear Assembly	1
5A	020018	Mitter Gear	1
5B	100-547	Tapper Pin	1
6	082003	Plunger-Knotter lock	1
7	074006	Spring-Knotter lock	1
8	100187	Screw-Set, Knotter lock, half dog point, 1/4-20 NC x 1 1/2 in. long	1
9	100150	Nut-Hex, knotter lock, 1/4 x 20 NC	1
10	074013	Spring-Flat, knotter	2
11	100131	Washer-Flat, No. 10	1
12	100192	Screw-Round head, 10-24 NC x 1 in. long	1
13	032042	Lever-Knotter	1
14	100009	Screw-Shoulder, knottter lever	1
15	100143	Nut-Hex, 10-24 NC	1
16	100120	Screw-Set, socket head, cup point, 10-32 NF x 5/16 in. long	1
17	100017	Oil Cup	1
18	017—	Knotter Body & Miter Gear	
19△	011004	Pivot Assembly-Knotter Head	1
20	100560	Nut 5/16 -18 Nylon Insert	1
21	100174	Roll Pin	1

△ Not Part of Assembly, Order Separately. * Specify Type Twine or Tape Being Used.

NOTES: 1. Sub-Assembly includes Items 3 and 4; 2. includes Items 5A and 5B.

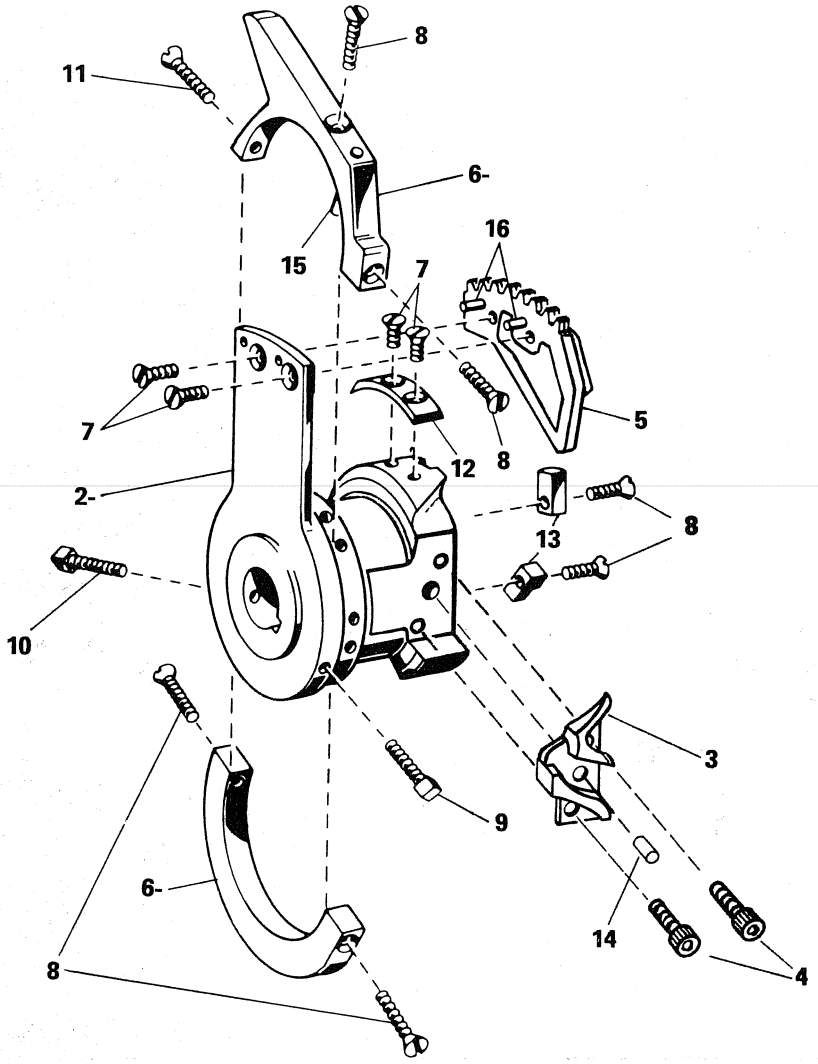
DUAL TENSION STRINGHOLDER ASSEMBLY



Index Number	Part Number	Description	Number Required
1	030140	Stringholder Dual Tension Assembly	1
2	030142	Stringholder and Pins Sub-Assembly	1
3	030014	Button-Stringholder	1
4	100610	Screw 10-32 x 3/8	2
5	074041	Spring	1
6	100144	Nut-Hex, 10-32 NF	2
7	100033	Washer-Stringholder-Button	1
8	032157	Lever-Button release	1
9	100010	Screw-Button release	1
10	032159	Knife Trap & Lever Assembly (short)	1
11	100562	Screw-Knife trap pivot	1
12	100586	Nut-Hex, 12-24 NC	2
13	074033	Spring-Knife trap	1
14	021009	Knife Package (total of 10)	1
15	100356	Screw-Binder head, 8-32 NF x 1/4 in long	1
16△	100565	Screw Socket Head Cap	1
17△	100011	Screw-Knife trap shoulder	1
18	030084	Slide-Lever	1
19	030083	Pivot	1
20	100088	Screw-Pivot	1
21	030085	Angle	1
22	030086	Link	1
23	100425	Nut-Hex, 12-24 (2 way lock)	1
24	100187	Screw-Set, half dog point 1/4 x 20 NC x 1 in. long	1
25	100188	Nut-Hex, 1/4 x 20 ESNA	1
26	100158	Spring Pin	1
27	100569	Grove Pin	2

* Specify Type Twine or Type Tape Being Used. △ Not Part of Assembly, Order Separately.

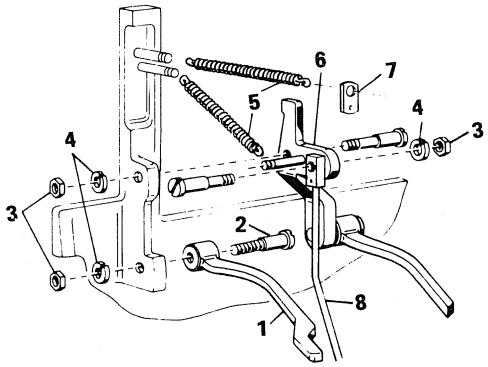
MAIN CAM ASSEMBLY



Index Number	Part Number	Description	Number Required
1	009—	Main Cam Assembly	1
2	009—	Main Cam and Switch (Index No. 3)	1
3	009025	Switch-Cam, knotter head (includes pin)	1
4	100109	Screw-Socket head, cap, 1/4-20 x 5/8 in. long	2
5	020135	Rack-Knotter cam	1
6	009—	Ring Cam	1
7	100102	Screw-Machine, flat head 12-24 NC x 3/4 in. long	4
8	100326	Screw-Machine, flat head 10-24 NC x 7/8 in. long	6
9	100128	Screw-Set, square head, cup point 5/16 - 18 NC x 1-1/4 in. long	1
10	100127	Screw-Set, square head, cup point 5/16-18 NC x 1-1/2 in. long	1
11	100095	Screw-Machine, flat head 10-24 x 5/8 in. long	1
12	009—	Riser Cam	1
13	009026	Clutch-Kickout Block (two required for cross-tie)	1
14	100161	Groove Pin	1
15	100160	Groove Pin	1
16	100372	Roll Pin	2

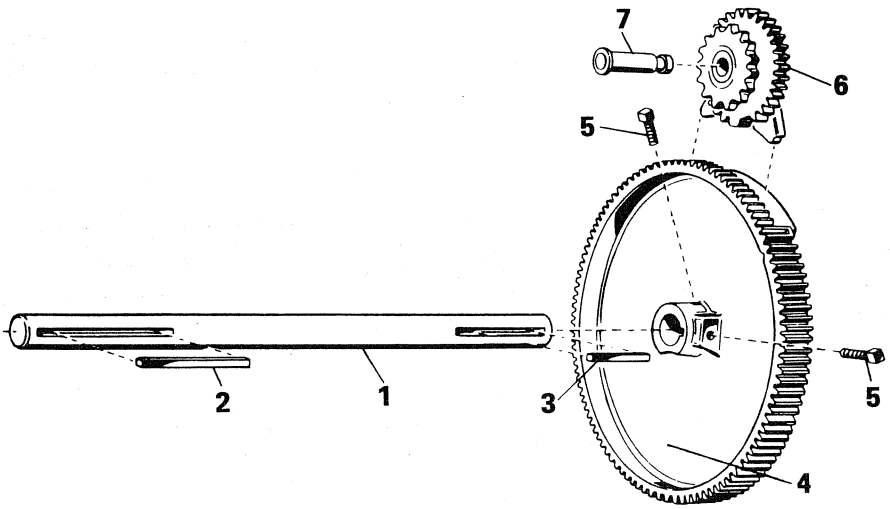
— Tying Machine Model Number and Serial Number Required When Ordering.

KICKOUT MECHANISM



Index Number	Part Number	Description	Number Required
1	032018	Lever-Clutch Kickout	1
2	100005	Screw-Trip Rod	3
3	100151	Nut-Hex, 1/4-28 NF	3
4	100135	Washer-Split Lock 1/4	2
5	074005	Spring-Trip Return	2
6	011007	Bell Crank Trip with lever, stud and pin	1
7	030016	Anchor Spring	1
8	006—	Trip Rod	1

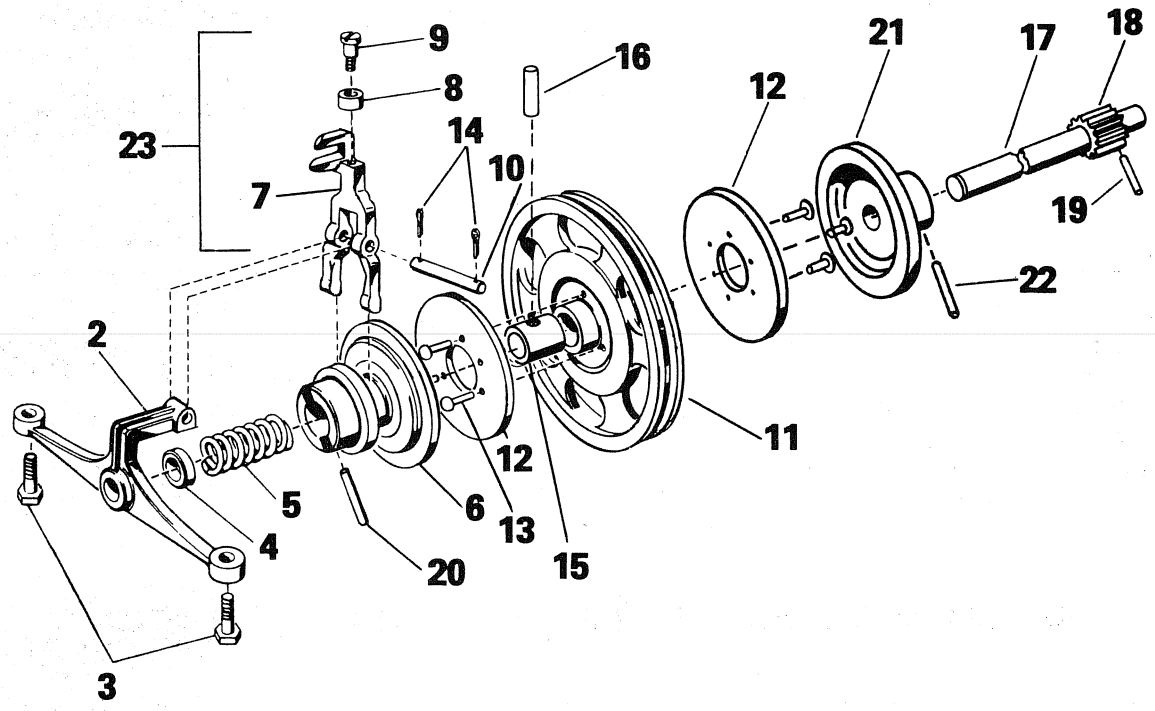
MAINSHAFT, MAIN GEAR & CHAIN GEAR ASSEMBLIES



Index Number	Part Number	Description	Number Required
1	012—	Main Shaft	1
2	083057	Key-Cam Wheel	1
3	083074	Key-Main Gear	1
4	020—	Main Gear	1
5	100127	Screw-Set Square Head, cup point, 5/16-18 x 1-1/2 in. long	1
6	020—	Chain Gear Assembly	1
7	081—	Stud-Chain Gear	1

— Tying Machine Model and Serial Number Required When Ordering.

CLUTCH ASSEMBLY



Index Number	Part Number	Description	Number Required
1	019—	Clutch Assembly	1
2△	013096	Lower-Bearing	1
3△	100115	Screw-Hex, head, 5/16-18 x 1 in. long	2
4	094005	Collar Clutch Shaft End	1
5	074004	Spring-Clutch	1
6	024002	Clutch Member-Outer	1
7△	071001	Fork-Clutch	1
8△	064002	Roller-Clutch Fork	1
9△	100002	Screw-Clutch Fork Roller	1
10△	083056	Pin-Clutch Fork Pivot	1
11	019093	Pulley	1
12	024003	Clutch Disc	2
13	100181	Drive Screw	6
14	100297	Hitch Pin	2
15	013099	Bearing Clutch	1
16	100601	Roll Pin	1
17	012—	Shaft	1
18	020—	Pinion-Clutch Shaft	1
19	100171	Taper Pin, No. 3 x 1-1/4 in long	1
20	083075	Pin-Clutch Pulley	1
21	024001	Clutch Member-Inner	1
22	100169	Taper Pin, No. 3 3 x 1-3/4 in. long	1
23	074004	Clutch Fork Assembly	1

— Tying Machine Model and Serial Number Required When Ordering.

△ Not Part of Assembly, Order Separately.